

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 13935/KC/lpm	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/AU2005/000137	International filing date (<i>day/month/year</i>) 4 February 2005	Priority date (<i>day/month/year</i>) 4 February 2004	
International Patent Classification (IPC) or national classification and IPC			
Int. Cl.	F16B 13/06 (2006.01) F16B 13/10 (2006.01) F16B 21/10 (2006.01) F16B 2/08 (2006.01) F16B 19/10 (2006.01) F16L 3/233 (2006.01)		
Applicant TELEZYGOLOGY INC et al			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 7 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input checked="" type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 2 September 2005	Date of completion of this report 10 May 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer JEFFREY CARL Telephone No. (02) 6283 2543

Box No. I **Basis of the report**1. With regard to the **language**, this report is based on:☒ The international application in the language in which it was filed☐ A translation of the international application into _____, which is the language of a translation furnished for the purposes of:☐ international search (under Rules 12.3(a) and 23.1 (b))☐ publication of the international application (under Rule 12.4(a))☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):☐ the international application as originally filed/furnished☒ the description:pages **1, 2, 4-6, 8-20** as originally filed/furnishedpages* **3, 3a, 7** received by this Authority on **5 May 2006** with the letter of **5 May 2006**

pages* _____ received by this Authority on _____ with the letter of _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* **21-24** received by this Authority on **5 May 2006** with the letter of **5 May 2006**

pages* _____ received by this Authority on _____ with the letter of _____

☒ the drawings:pages **1-15** as originally filed/furnished

pages* _____ received by this Authority on _____ with the letter of _____

pages* _____ received by this Authority on _____ with the letter of _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.3. ☐ The amendments have resulted in the cancellation of:☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheets/figs _____☐ the sequence listing (*specify*): _____☐ any table(s) related to the sequence listing (*specify*): _____4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheets/figs _____☐ the sequence listing (*specify*): _____☐ any table(s) related to the sequence listing (*specify*): _____* *If item 4 applies, some or all of those sheets may be marked "superseded."*

Box No. IV **Lack of unity of invention**

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:
- ☐ restricted the claims
 - ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☐ neither restricted the claims nor paid additional fees
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
 - ☒ not complied with for the following reasons:

Claims 1-25, 31 and 32 are directed to fasteners for securing work pieces together, the fastener characterised by having first and second work engaging members, the first work engaging member being mounted on a longitudinal body and being adapted for movement relative to the longitudinal body and towards the work piece to be engaged and the second work engaging member being capable of assuming a position with a narrow cross-sectional area or position with a wide cross-sectional area.

Claims 26-30 and 33 are directed to a connecting means adapted to releasably fix a first element and a second element, the connecting means being characterised by including a locking means movable within a deformable channel, the locking means having rotatable elements that rotate about an axis that is transverse to the longitudinal axis of the deformable channel so as to either prevent deformation of the channel and so lock the elements together, or to allow deformation of the channel so as to release the first element from the second element.

Each of the abovementioned groups of claims has a different distinguishing feature and they do not share any feature which could satisfy the requirement for being a special technical feature. Because there is no common special technical feature it follows that there is no technical relationship between the identified inventions. Therefore the claims do not satisfy the requirement of unity of invention a priori.

4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-33	YES
	Claims	NO
Inventive step (IS)	Claims 1-33	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-33	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

(i)	US 6443403	(vi)	EP 1229255
(ii)	US 3552696	(vii)	AU 46246/72
(iii)	US 4637765	(viii)	US 5531551
(iv)	US 3918130	(ix)	WO 2000/036309
(v)	US 4856950	(x)	US 3406431

Novelty (N) and Inventive Step (IS) Claims 1-33

Claims 1-25, 31, 32: These amended claims are directed to fasteners for securing work pieces together, the fastener characterised by having first and second work engaging members, the first work engaging member being mounted on a longitudinal body and being adapted for movement relative to the longitudinal body and towards the work piece to be engaged and the second work engaging member being capable of assuming a position with a narrow cross-sectional area or position with a wide cross-sectional area.

No individual document, nor obvious combination of documents, discloses a fastener having all of the features defined.

The closest art of document (ix) has most of the features defined but it does not disclose any means on the longitudinal body for adjusting the position of the first work engaging member on the longitudinal body.

Claims 26-30, 33

These amended claims are directed to a connecting means adapted to releasably fix a first element and a second element, the connecting means being characterised by including a locking means movable within a deformable channel, the locking means having rotatable elements that rotate about an axis that is transverse to the longitudinal axis of the deformable channel so as to either prevent deformation of the channel and so lock the elements together, or to allow deformation of the channel so as to release the first element from the second element.

No individual document, nor obvious combination of documents, discloses a connecting means having all of the features defined.

The closest art of document (x) discloses a connecting means having a locking means including rotatable elements but it does not disclose any deformable channel.

of the fastener is sheared off so as to be left behind. Embodiments of the present invention may be useful in a "blind" situation.

Disclosure of the Invention

Accordingly, in a first aspect, the present invention provides a fastener including:-

5 a longitudinal body;

a first work engaging member mounted on the longitudinal body and adapted for movement relative thereto towards a work to be engaged;

a second work engaging member associated with the longitudinal body; and

10 means on the longitudinal body for adjusting position of the first work engaging member on the longitudinal body,

the second work engaging member including means capable of assuming a first position of narrow cross-sectional area and a second position of wide cross-sectional area.

The fastener of the invention is preferably intended for use as a temporary fastener.

However, the fastener of the invention may also be employed as a permanent fastener.

15 Such a fastener can be used as a temporary fastener or tack, especially in the aerospace industry, the fastener being removed by drilling out where it is no longer required.

The fastener is preferably made fully or partly of material such as glass-filled nylon or similar material (but other materials may also be suitable). One or more different materials may be used in combination. For recycling purposes, it is preferred to use a
20 single material, however.

The fastener of the invention may take any suitable shape. Non limiting examples are cross-sectional shapes which are circular, square or hexagonal. Similarly, elements of the fastener may have cross-sectional shapes which are circular, square or hexagonal, as examples.

25 The first work engaging member may take the form of a bearing or pressure foot, mounted on the longitudinal body and adapted to be urged towards work surfaces which are to be trapped between the first work engaging member and the second work engaging member, so as to create pressure on the work surfaces and compress them together. The first work engaging member may include a shear gallery to assist in shearing off the
30 second work engaging member in those embodiments where this is desirable.

The first work engaging member, preferably in the form of the pressure foot, may present a flat profile or a profile of another shape to the work surface it is to contact. The foot

The present invention, in connection with the first aspect, also includes a method of fastening work surfaces using the fastener of the invention, the method including the steps of:

inserting the second work engaging member into an aperture in the work surfaces;

5 causing the means included in the second work engaging member to assume the second position of wide cross-sectional area;

using the position adjusting means to cause the first work engaging member to move on the longitudinal body towards the work surfaces so that the work surfaces are held in desired contact between the first and second work engaging members;
10 and

optionally removing substantially all of the longitudinal body accessible beyond the first work engaging member and the advance element.

In further association with the first aspect of the invention, the present invention provides a method of removing the fastener of the invention from work surfaces fastened by the
15 fastener, the method including the steps of:

causing the second work engaging member to assume the first position of narrow cross-sectional area; and

withdrawing the fastener from the aperture in the work surfaces.

In order to cause the second work engaging member to assume the first position, in some
20 embodiments it may be necessary to disengage the position adjusting means, such as the pawl element from the ratchet teeth, for example, in the two-part embodiment referred to above. This may involve breaking off part of the pawl element. In other cases, it may not be necessary to disturb the engagement of the pawl element with the ratchet teeth. Further details of these arrangements are illustrated in the accompanying drawings and
25 described below.

In a second aspect, the present invention provides a fastener including:

a first longitudinal body having first engaging means; and

a second longitudinal body having:

an opening adapted to receive the first longitudinal body; and

30 second engaging means in at least part of the opening;

Claims

1. A fastener including:-

a longitudinal body;

a first work engaging member mounted on the longitudinal body and adapted for
movement relative thereto towards a work to be engaged;

a second work engaging member associated with the longitudinal body; and

means on the longitudinal body for adjusting position of the first work engaging
member on the longitudinal body,

the second work engaging member including means capable of assuming a first
position of narrow cross-sectional area and a second position of wide cross-sectional
area.

2. The fastener of Claim 1, wherein the first work engaging member is a pressure foot
mounted on the longitudinal body and adapted to be urged towards work surfaces
which are to be trapped between the first work engaging member and the second work
engaging member.

3. The fastener of Claim 1 or 2, wherein the second work engaging member is mounted
on or attached to or integral with the longitudinal body.

4. The fastener of Claim 1 or 2, wherein the second work engaging member is integral
with, or joined to, the first work engaging member.

5. The fastener of any one of Claims 1 to 4, wherein the means capable of assuming the
first and second positions includes wings or leaves.

6. The fastener of any one of Claims 1 to 5, wherein the position adjusting means
includes ratchet teeth and a pawl.

7. The fastener of Claim 6, wherein the ratchet teeth are on the longitudinal body.

8. The fastener of Claim 6 or 7, wherein the pawl is formed integrally with the first work
engaging means.

9. The fastener as claimed in Claim 8, wherein the first work engaging member, the
second work engaging member and the pawl element are made in one piece or are in a
fixed spatial relationship.

10. The fastener as claimed in any one of Claims 1 to 8, wherein the second work engaging member is connected to or integral with the longitudinal body.
11. The fastener of any one of Claims 1 to 10, which includes means for attaching one or more elements.
- 5 12. The fastener of Claim 11, wherein a cable tie is integrated with the first work engaging member.
13. The fastener of any one of Claims 1 to 12 when mounted in or formed with a feeder strip.
14. A method of fastening work surfaces using the fastener of any one of Claims 1 to 13,
10 the method including the steps of:
- inserting the second work engaging member into an aperture in the work surfaces;
causing the means included in the second work engaging member to assume the second position of wide cross-sectional area;
- using the position adjusting means to cause the first work engaging member to
15 move on the longitudinal body towards the work surfaces so that the work surfaces are held in desired contact between the first and second work engaging members;
and
- optionally removing substantially all of the longitudinal body accessible beyond the first work engaging member and the position changing means.
- 20 15. A method of removing the fastener of any one of Claims 1 to 13 from work surfaces fastened by the fastener, the method including the steps of:
- causing the second work engaging member to assume the first position of narrow cross-sectional area; and
- withdrawing the fastener from the aperture in the work surfaces.
- 25 16. A fastener including:
- a first longitudinal body having first engaging means; and
- a second longitudinal body having:
- an opening adapted to receive the first longitudinal body; and

second engaging means in at least part of the opening;

wherein the first and/or second engaging means is adapted to deform sufficiently to permit the first longitudinal body to slide axially through the opening in the second longitudinal body and wherein the second engaging means is adapted to engage the first engaging means on the first longitudinal body when one longitudinal body is rotated relatively to the other.

17. The fastener of Claim 16 which includes means capable of assuming a first position of narrow cross-sectional area and a second position of wide cross-sectional area.
18. The fastener of Claim 17, in which the means capable of assuming the first and second position is part of or attached to the second longitudinal body.
19. The fastener of any one of Claims 16 to 18, in which the first and second engaging means permit unidirectional movement of the first longitudinal body within the second longitudinal body.
20. The fastener of any one of Claims 16 to 19, wherein the first longitudinal body includes the first engaging means for some or all of its length.
21. The fastener of any one of Claims 16 to 20, wherein the first engaging means is a helical thread or serrations or grooves, each having a shoulder adapted to engage a barb or shoulder in the second engaging means.
22. The fastener of any one of Claims 17 to 21 wherein the second longitudinal body is substantially cylindrical and the means capable of assuming the first position of narrow cross-sectional area and the second position of wide cross-sectional area comprises a continuation of the cylinder, the cylinder being partially segmented.
23. The fastener of Claim 22, wherein the means are wings hinged to the cylinder.
24. The fastener of any one of Claims 16 to 23, wherein the second engaging means takes the form of threads or annular grooves and projections, adapted to deform and increase in cross-sectional area through longitudinal slits cut into the threads or grooves and projections.
25. The fastener of any one of Claims 1 to 13 or 16 to 24, wherein one end of the longitudinal body is adapted to engage an insertion tool and the other end is a probe.
26. A connecting means adapted to releasably fix a first element and a second element, the connecting means including a locking means movable by activation means between

- a locked position in which the first element is locked to the second element and an unlocked position in which the first element is released from the second element, wherein the locking means is moveable in a deformable channel having a longitudinal axis and in the first position the locking means prevents deformation of the channel in the region of the locking means and wherein the locking means is at least one rotatable element adapted to be rotatable within the deformable channel about an axis transverse to the longitudinal axis of the deformable channel.
- 5
27. The connecting means of claim 26, wherein the locking means is wedge shaped.
28. The connecting means of claim 26 or 27, wherein the activation means includes or comprises a magnet or electromagnet.
- 10
29. The connecting means of claim 28, wherein the locking means includes two or more rotatable elements adapted to cause a bar to rise or lower
30. The connecting means of any one of claims 26 to 29, which has two or more of the locking means.
- 15
31. The fastener of any one of claims 1 to 13 substantially as herein described with reference to Figures 1 to 4 or 5 to 10 or 11 to 18 or 19 and 20 of the accompanying drawings.
32. The fastener of any one of claims 16 to 25 substantially as herein described with reference to Figures 21 to 24 or 25 to 27 of the accompanying drawings
- 20
33. The fastener of any one of claims 26 to 30 substantially as herein described with reference to Figures 29 to 34 of the accompanying drawings